REMARKS

This Amendment is filed in response to the Office Action mailed on May 13, 2004. All objections and rejections are respectfully traversed.

Claims 1-23 are in the case.

Claims 13-23 have been added to better claim the invention.

Claims 11-12 have been amended to better claim the invention.

Claims 6 and 9 have been allowed by the Examiner.

At paragraph 1 of the Office Action, claims 1, 7, 8, and 10-12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Lyon et al., U.S. Patent No. 6,333,917, issued on December 25, 2001, hereinafter Lyon.

The present invention, as set forth in representative claim 1, comprises in part:

A network device, comprising:

a first linecard receiving input computer network packets from a computer network, said line card translating said packets into segments;

a switching fabric receiving segments from said linecard, said switching fabric to route said segments to a desired output linecard, said switching fabric having at least one queue therein, said *queue having a threshold such that in the event that a segment arrives at said queue and said queue is filled above said threshold, a bit of said segment is set as said segment is passed out of said queue*, said bit being set "marking" said segment as that segment having passed through a queue filled above said lower threshold level;

a second line card receiving said segments from said switching fabric, said second linecard translating said segments into a computer network packet for transmission by said second linecard out through a port connected to an output computer network;

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a circuit determining whether or not a particular segment of said segments received by said second linecard has said bit set indicating that said segment is marked, *and in response to detecting a segment as being marked, discarding said output packet in accordance with a random probability*, and in response to detecting that no segment of said output packet is marked, transmitting said output packet onto said computer network.

The AAPA simply describes a network switch that has: a first linecard to receive packets and convert the packets into equal length segments; a switching fabric, including queues, to receive segments from the first linecard; and a second linecard to receive the segments from the switching fabric and translate the segments into a packet for transmission.

Lyon discloses enhanced random early detection (RED+) systems and uses of the systems within a switching fabric and linecards. Lyon reduces the delay in notifying a transmitting source to slow its transmission rate by tagging (or dropping) a packet as it leaves the queue (on dequeue) when the system detects a congested condition. The packets that are tagged are the packets immediately leaving the queue at the time the system detects the congestion. These packets are tagged according to a tagging period or rate, which is predefined within the system.

Applicant respectfully urges that neither the AAPA nor Lyon show Applicant's claimed novel "*queue having a threshold such that in the event that a segment arrives at said queue and said queue is filled above said threshold, a bit of said segment is set as said segment is passed out of said queue* and *in response to detecting a segment as being marked, discarding said output packet in accordance with a random probability.*"

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Applicant's claimed invention is a system that uses marked segments to detect congestion in a network. When a packet enters an input linecard, it is translated into segments. When each segment enters the switching fabric of a network device and a queue of the switching fabric containing a <u>particular segment</u> is filled above a threshold, a bit of *said segment is set*. That is, the <u>particular segment</u> that has <u>entered</u> a queue above its threshold will have a bit set. From there, Applicant's system can detect this bit, and use *a random probability* when deciding whether to discard the packet. In contrast, Lyon does not set a bit of the <u>particular segment</u> that enters the queue above the threshold, but instead Lyon adds a tag to (or drops) the very next <u>packet</u> to <u>leave</u> the queue when the congested condition is detected. Also, in Lyon, these tags are only set at a specified (*non-random*) periodic rate, so not every packet leaving the queue filled above its threshold will receive a tag. The AAPA is simply directed toward the network device, and does not address setting bits of segments that pass through filled queues.

Applicant respectfully urges that the AAPA and the Lyon patent, either taken singly or in any combination, are legally insufficient to render the presently claimed invention obvious under 35 U.S.C. §103 because of the absence in each of the cited patents of Applicant's claimed novel "*queue having a threshold such that in the event that a segment arrives at said queue and said queue is filled above said threshold, a bit of said segment is set as said segment is passed out of said queue* and *in response to detecting a segment as being marked, discarding said output packet in accordance with a random probability.*"

Further, an analysis under *Graham v. Deere*, 383 U.S. 1, 148 U.S.P.Q. 459, (1966), and cited in MPEP 706.02 (m), comes to the same conclusion, that the claimed invention is novel and non-obvious. The three analytic criteria under *Graham v. Deer* are:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

Further, objective evidence present in the application indicating obviousness or nonobviousness is considered.

Using these analytic criteria, one then makes a legal determination as to whether or not a person of ordinary skill in the pertinent art would have found the claimed invention to be obvious at the time that the invention was made.

1. First, the scope and content of the prior art is determined by reference to the cited two items, Applicant's Admitted Prior Art (AAPA) and Lyon.

The scope and content of the prior art is summarized as:

A. Applicant's Background art mentions that a network switch can receive packets and convert the packets into equal length segments, switch the segments in a switching fabric, including queues, and translate the segments back into a packet for transmission. Applicant's Background art suggests that that the past methods are inadequate to implement a RED algorithm to this arrangement.

B. Lyon discloses RED system by tagging (or dropping) a packet as it leaves the queue when the system detects a congested condition. These packets are tagged according to a tagging period or rate, which is predefined within the system.

2. The differences between the claimed invention and the cited art are, as set out in the claimed invention:

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A network device, comprising:

a first linecard receiving input computer network packets from a computer network, said line card translating said packets into segments;

a switching fabric receiving segments from said linecard, said switching fabric to route said segments to a desired output linecard, said switching fabric having at least one queue therein, said *queue having a threshold such that in the event that a segment arrives at said queue and said queue is filled above said threshold, a bit of said segment is set as said segment is passed out of said queue*, said bit being set "marking" said segment as that segment having passed through a queue filled above said lower threshold level;

a second line card receiving said segments from said switching fabric, said second linecard translating said segments into a computer network packet for transmission by said second linecard out through a port connected to an output computer network;

a circuit determining whether or not a particular segment of said segments received by said second linecard has said bit set indicating that said segment is marked, *and in response to detecting a segment as being marked, discarding said output packet in accordance with a random probability*, and in response to detecting that no segment of said output packet is marked, transmitting said output packet onto said computer network.

Applicant respectfully urges that none of the cited art show Applicant's claimed novel "*queue having a threshold such that in the event that a segment arrives at said queue and said queue is filled above said threshold, a bit of said segment is set as said segment is passed out of said queue* and *in response to detecting a segment as being marked, discarding said output packet in accordance with a random probability*."

3. The level of ordinary skill in the art of network devices, switching fabrics, and the RED algorithm can be ascertained by reference to Applicant's Background statement that the present methods of implementing a RED algorithm to a network switch that converts packets into segments, switches the segments in a switching fabric, including queues, and translates the segments back into a packet for transmission are inadequate.

The level of ordinary skill in the art of network devices, switching fabrics, and the RED algorithm can be ascertained from the AAPA and Lyon as either dividing a packet into **segments** that are sent through different queues and **not** implementing a RED algorithm, or as applying a RED algorithm to **whole packets.** Nowhere is the use of a *queue having a threshold such that in the event that a segment arrives at said queue and said queue is filled above said threshold, a bit of said segment is set as said segment is passed out of said queue* mentioned in the cited art for *in response to detecting a segment as being marked, discarding said output packet in accordance with a random probability.*

Accordingly, the legal conclusion which is required by the application of the *Graham v. Deere* analytic method, is that a person of ordinary skill in the art of the cited art could not have found the present invention obvious, because of the absence of the claimed elements of the presently claimed invention in all of the cited art.

Further, Applicant respectfully urges that the AAPA teaches away from Applicant's claimed invention. The AAPA would lead a person of ordinary skill in the art to believe that, prior to Applicant's claimed invention, there were no present methods of implementing a RED algorithm to a network switch that converts packets into segments, switches the segments in a switching fabric, including queues, and translates the segments back into a packet for transmission. The AAPA simply breaks up packets into segments, and there is no mechanism for marking the segments and informing an output linecard that a congestion problem exists.

Applicant also respectfully urges that Lyon teaches away from Applicant's claimed invention. Lyon would lead a person of ordinary skill in the art to believe that to

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implement a RED algorithm, whole packets must be used. Lyon, in essence, suffers from the same problem that Applicant's invention addresses. Lyon also potentially worsens this problem by discarding packets at a rate or specified period, thereby discarding packets from a source that may not be causing the congestion problem.

Applicant respectfully urges that the combination of these two references would teach a person of ordinary skill in the art away from Applicant's claimed novel *queue having a threshold such that in the event that a segment arrives at said queue and said queue is filled above said threshold, a bit of said segment is set as said segment is passed out of said queue* and *in response to detecting a segment as being marked, discarding said output packet in accordance with a random probability* by leading them to believe that it could not have been done.
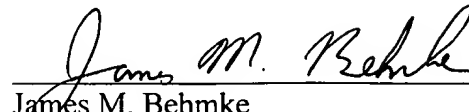
All independent claims are believed to be in condition for allowance.

All dependent claims are believed to be dependent from allowable independent claims, and therefore in condition for allowance.

Favorable action is respectfully solicited.

Please charge any additional fee occasioned by this paper to our Deposit Account
No. 03-1237.

Respectfully submitted,

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